Commonwealth of Massachusetts

Executive Office of Energy and Environmental Affairs

Massachusetts Environmental Policy Act

MEPA Climate Resiliency Policy

May 6, 2022

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BACKGROUND: Chronology

- 2008: Global Warming Solutions Act adds requirement to consider climate change in Section 61 of MEPA
- 2010: MEPA Greenhouse Gas (GHG) Emissions Policy released
- 2014: *Draft* MEPA Climate Adaptation and Resiliency Policy issued for comment but not finalized
- 2016: Executive Order 569 requires state planning for climate change
- 2018: Statewide Integrated Hazard Mitigation and Climate Adaptation (SHMCAP) released
- Feb. 2021: MEPA Interim Protocol on Climate Adaptation and Resiliency issued for comment
- Apr. 2021: Climate Resilience Design Standards Tool released
- Oct. 1, 2021: Effective date of MEPA Interim Protocol on Climate Adaptation and Resiliency

BACKGROUND: Resilience Design Tool Outputs

Table 3.3. Recommended Return Periods Provided by the beta Tool for the Sea Level Rise & Storm Surge Climate Parameter

SEA LEVEL RISE & STORM SURGE							
	Criticality[1]	Exposure Service Life[1]	Buildings/Facilities	Infrastructure			
				Transportation	*Dams & Flood Control*	*Utilities*	*Solid/Haz. Waste*
			Return Period (% AEP)	Return Period (% AEP)	Return Period (% AEP)	Return Period (% AEP)	Return Period (% AEP)
	High	51-100 years	500-yr (0.2%)	1000-yr (0.1%)	500-yr (0.2%)	500-yr (0.2%)	1000-yr (0.1%)
	Medium	51-100 years	200-yr (0.5%)	200-yr (0.5%)	200-yr (0.5%)	200-yr (0.5%)	200-yr (0.5%)
	Low	51-100 years	100-yr (1%)	100-yr (1%)	100-yr (1%)	100-yr (1%)	100-yr (1%)
	High	11-50 years	200-yr (0.5%)	500-yr (0.2%)	200-yr (0.5%)	200-yr (0.5%)	500-yr (0.2%)
	Medium	11-50 years	100-yr (1%)	200-yr (0.5%)	100-yr (1%)	100-yr (1%)	200-yr (0.5%)
	Low	11-50 years	50-yr (2%)	100-yr (1%)	50-yr (2%)	50-yr (2%)	100-yr (1%)
	High	10 years or less	100-yr (1%)	100-yr (1%)	100-yr (1%)	100-yr (1%)	100-yr (1%)
	Medium	10 years or less	50-yr (2%)	50-yr (2%)	50-yr (2%)	50-yr (2%)	50-yr (2%)
	Low	10 years or less	20-yr (5%)	20-yr (5%)	20-yr (5%)	20-yr (5%)	20-yr (5%)

1. Criticality and Exposure Service Life are not outputs, but the relationship informs the recommended return period from the beta Tool.

BACKGROUND: Resilience Design Tool Outputs

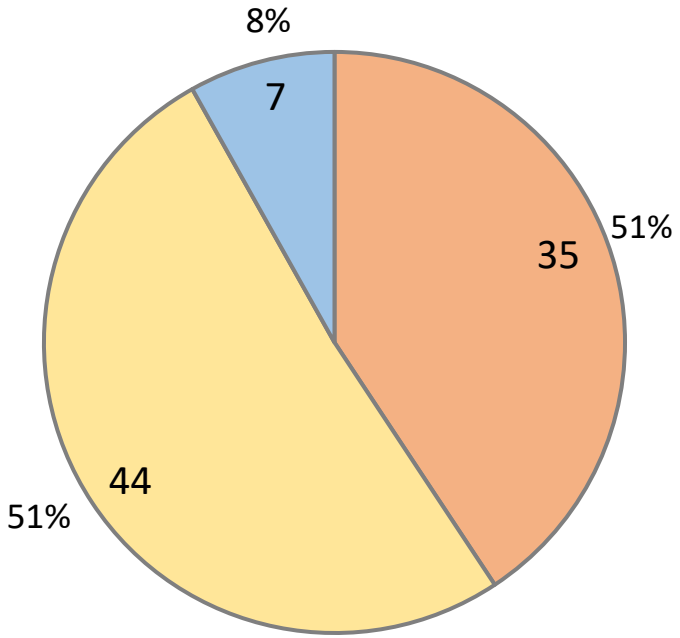
Table 3.11. Recommended Return Periods Provided by the beta Tool for the Extreme Precipitation Climate Parameter

			BUILDINGS/ FACILITIES	INFRASTRUCTURE			
				Transportation	*Flood Control*	*Utilities*	*Solid/Haz. Waste*
EXTREME PRECIPITATION	Criticality	Useful Life	Return Period (Annual Probability)	Return Period (Annual Probability)	Return Period (Annual Probability)	Return Period (Annual Probability)	Return Period (Annual Probability)
	High	51-100 years	100-yr (1%)	100-yr (1%)	500-yr (0.2%)	100-yr (1%)	100-yr (1%)
	Medium	51-100 years	50-yr (2%)	50-yr (2%)	100-yr (1%)	50-yr (2%)	50-yr (2%)
	Low	51-100 years	25-yr (4%)	25-yr (4%)	50-yr (2%)	25-yr (4%)	25-yr (4%)
	High	11-50 years	50-yr (2%)	50-yr (2%)	100-yr (1%)	50-yr (2%)	50-yr (2%)
	Medium	11-50 years	25-yr (4%)	25-yr (4%)	50-yr (2%)	25-yr (4%)	25-yr (4%)
	Low	11-50 years	10-yr (10%)	10-yr (10%)	25-yr (4%)	10-yr (10%)	10-yr (10%)
	High	10 years or less	25-yr (4%)	25-yr (4%)	50-yr (2%)	25-yr (4%)	25-yr (4%)
	Medium	10 years or less	10-yr (10%)	10-yr (10%)	25-yr (4%)	10-yr (10%)	10-yr (10%)
	Low	10 years or less	5-yr (20%)	5-yr (20%)	10-yr (10%)	5-yr (20%)	5-yr (20%)

MEPA Project Data (Oct. 1, 2021 to Mar. 31, 2022)

	2021	2022	TOTAL
Infrastructure	18	17	35
Building / Facility	28	16	44
Natural Resources	2	5	7
TOTAL	48	38	**86**

86 new projects
14 mandatory EIRs
3 discretionary EIRs
(*Note*: 15 new projects filed near EJ populations 1/1/22 – 3/31/22)

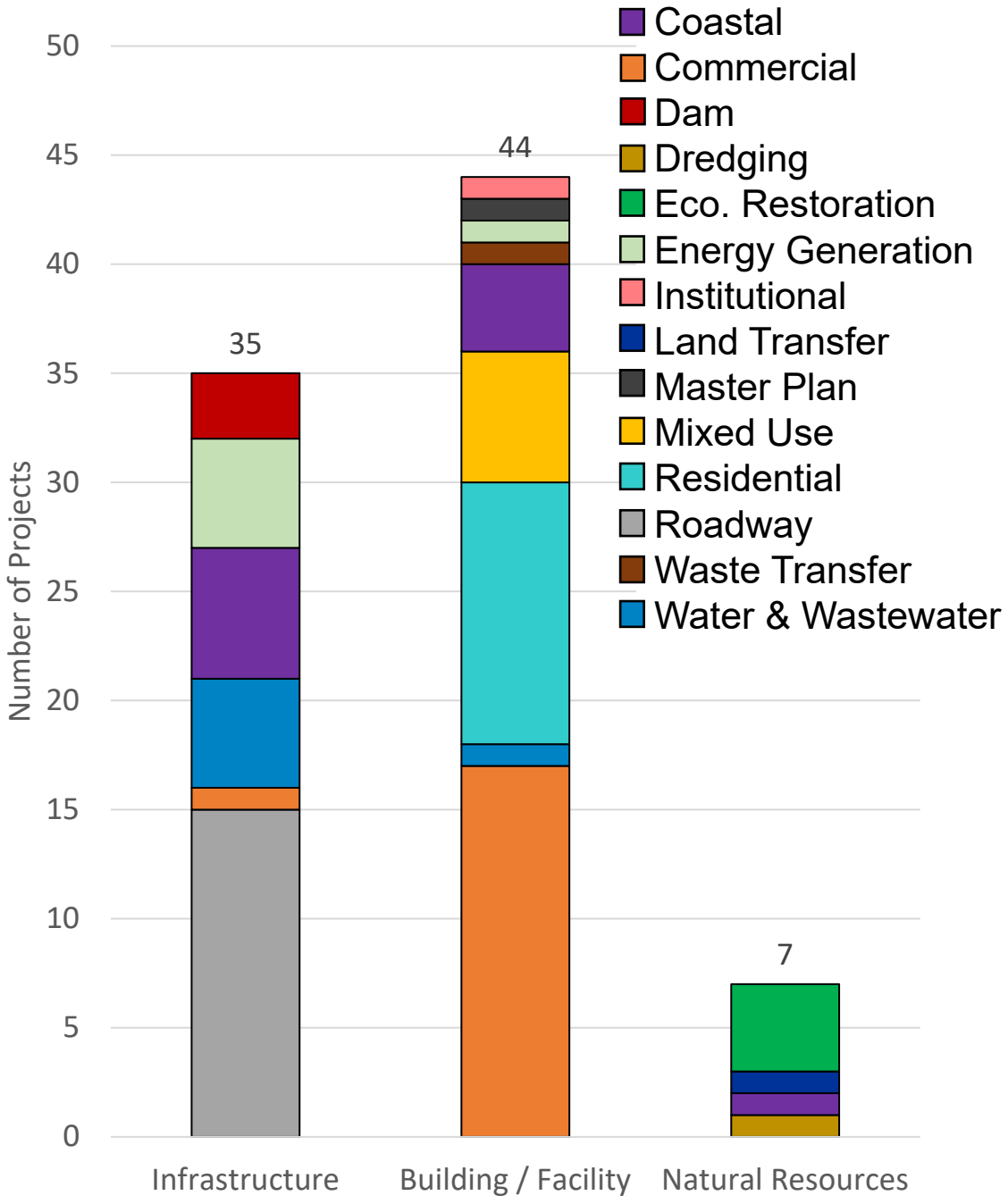


86 New Projects Subject to Interim Protocol

MEPA Project Data

Top projects in each category

- Infrastructure
  - Transportation (15)
  - Energy Generation (5)
  - Coastal Structures (6)
  - Water and Wastewater (6)
- Building/Facility
  - Commercial (17)
  - Residential (12)
- Natural Resources
  - Ecological Restoration and Resiliency (4)
  - Coastal Nourishment, Dredging & Land Transfer



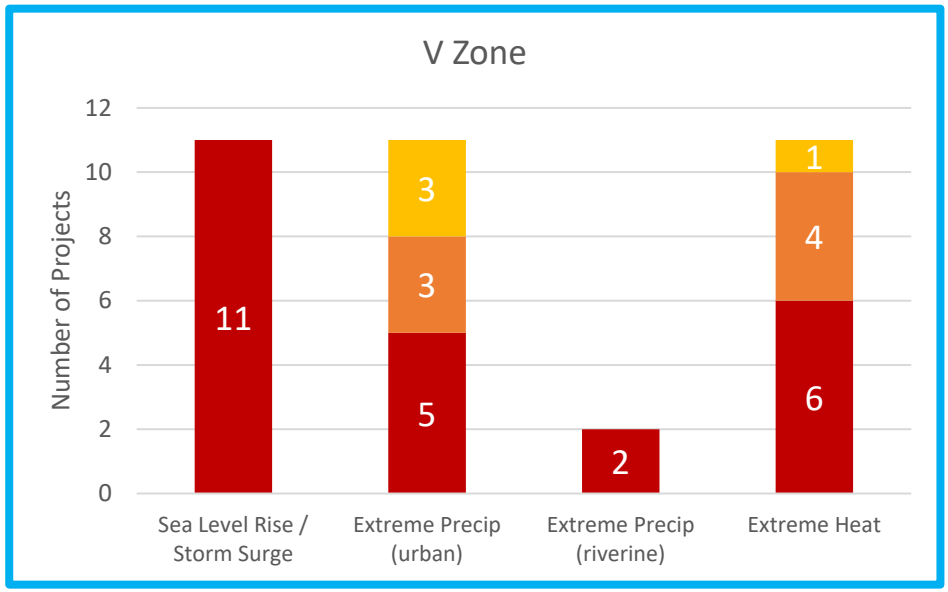
MEPA Project Data

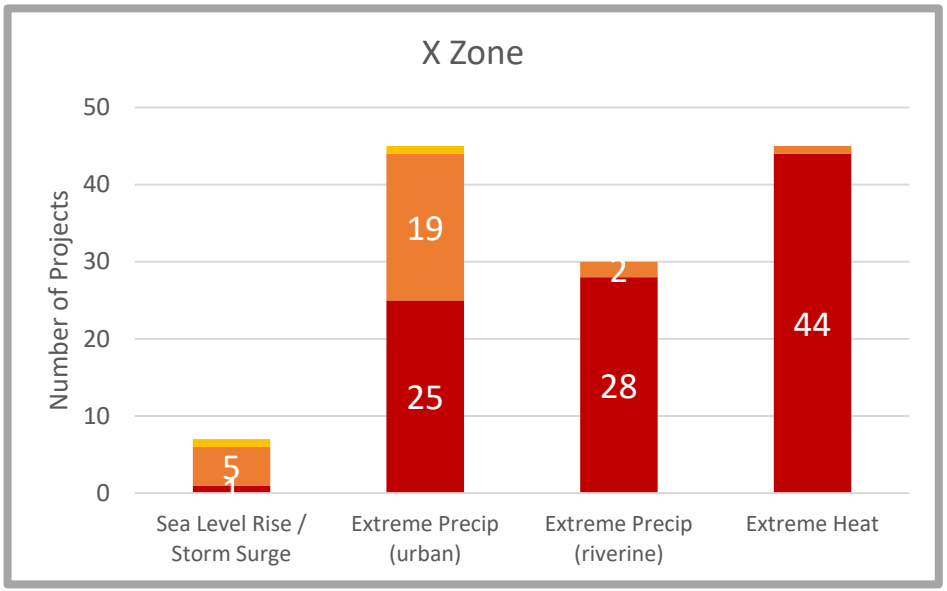
Exposure Rating

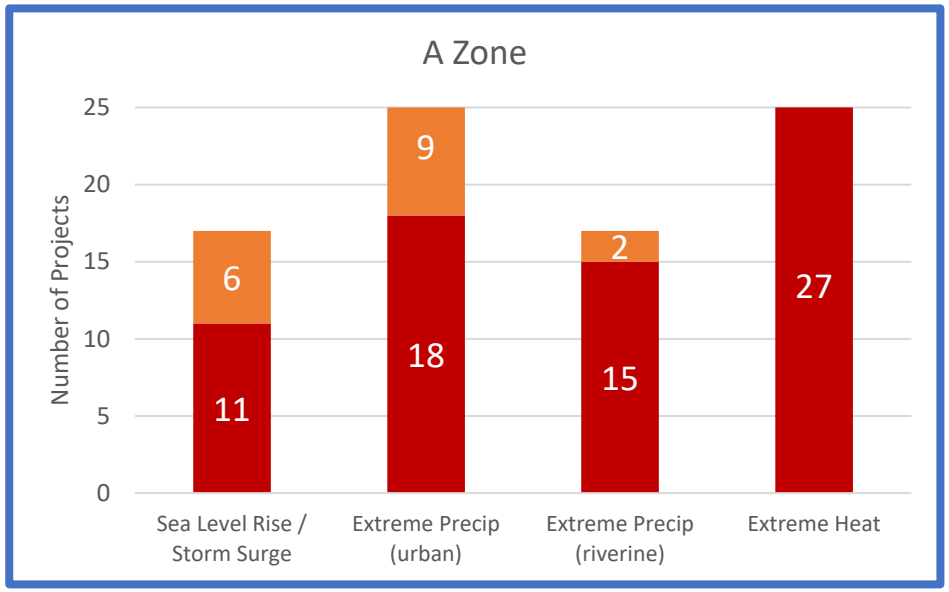
- High
- Moderate
- Low

- V Zones: 11
- A Zones: 28
- X Zones: 45*

*5 in 500-yr floodplain

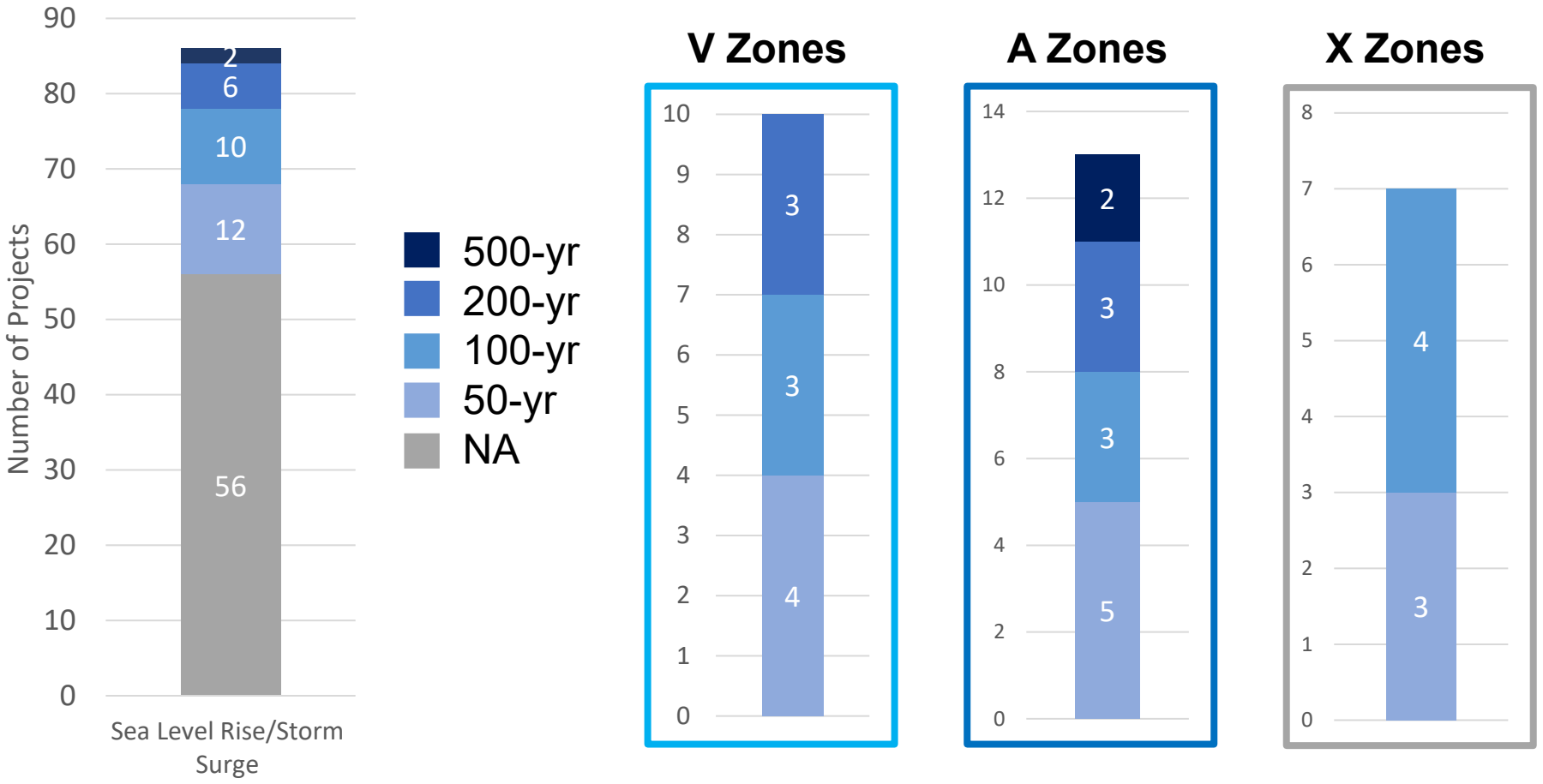






MEPA Project Data

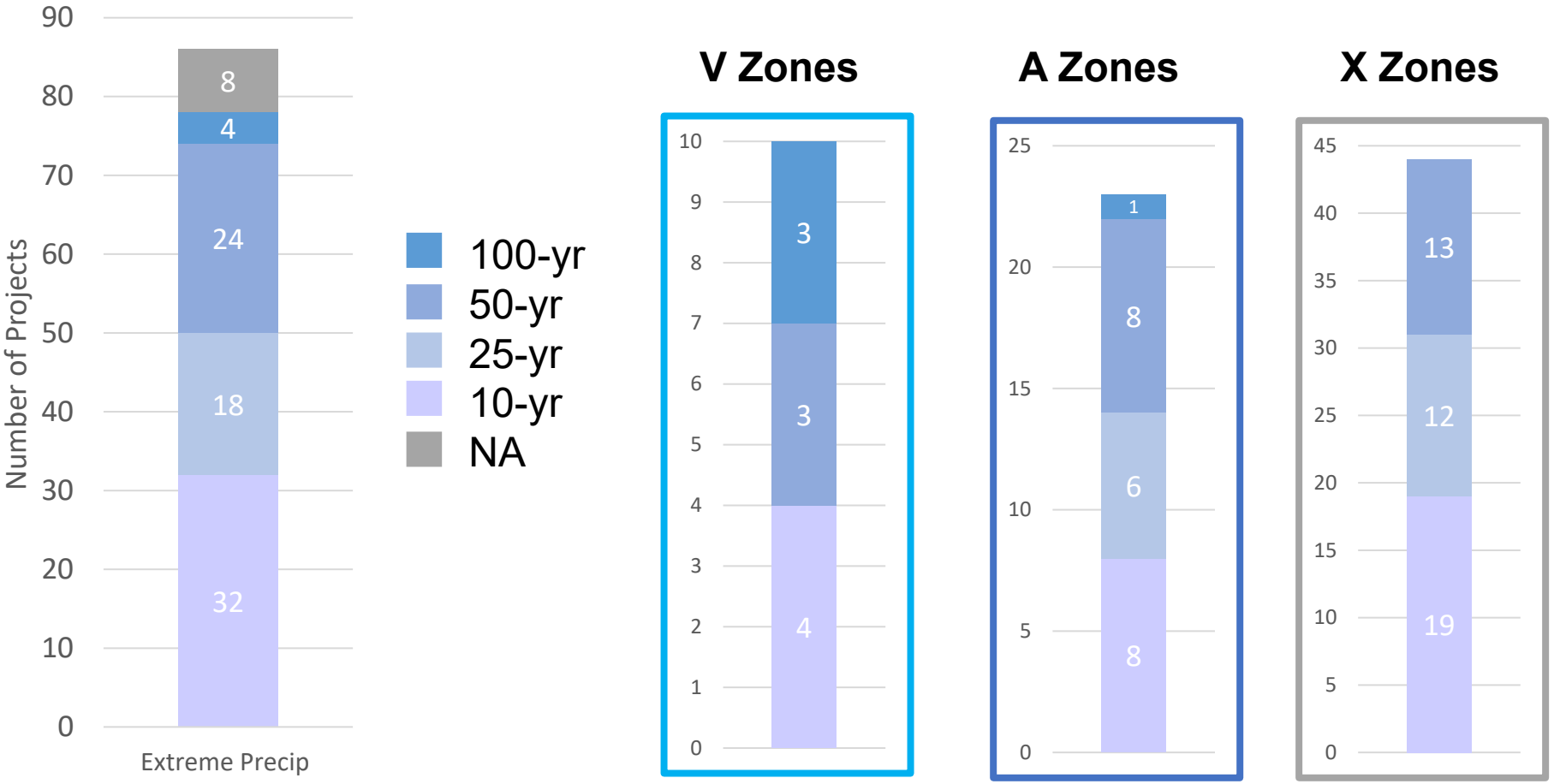
Return Period: Sea Level Rise & Storm Surge



Natrual Resource projects do not receive return periods.

MEPA Project Data

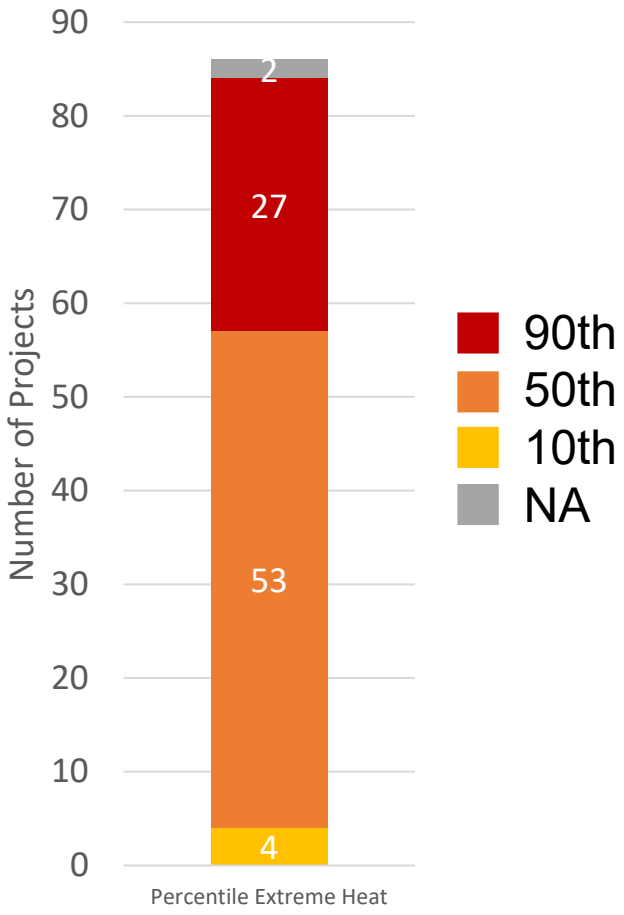
Return Period: Extreme Precipitation

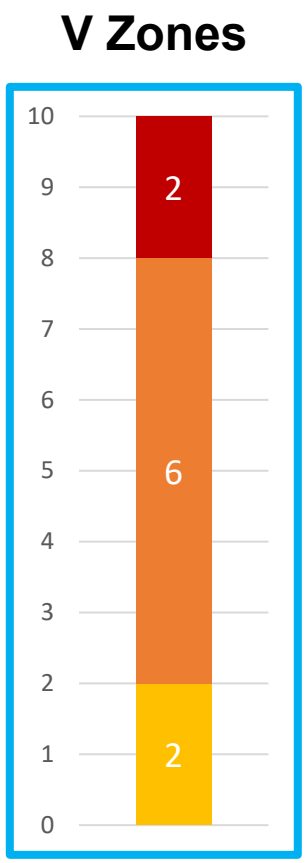


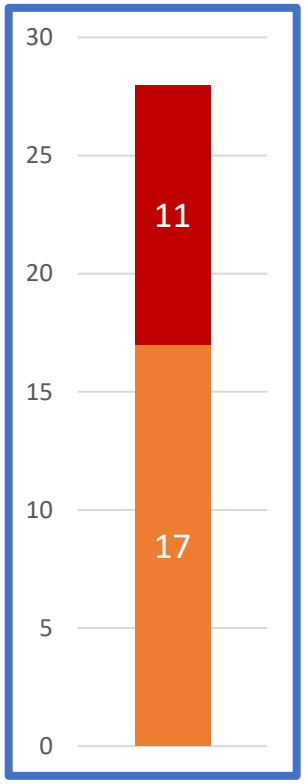
Natrual Resource projects do not receive return periods.
Two projects missing FEMA Zones.

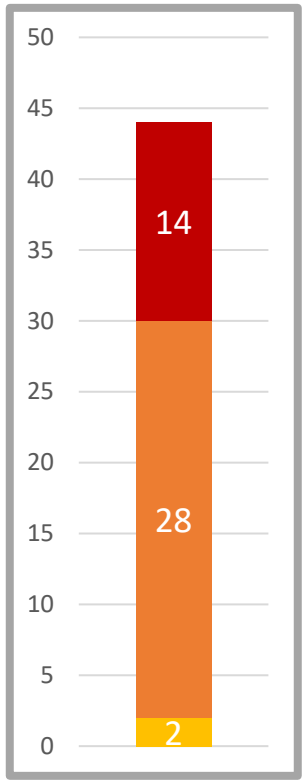
MEPA Project Data

Extreme Heat: Percentile





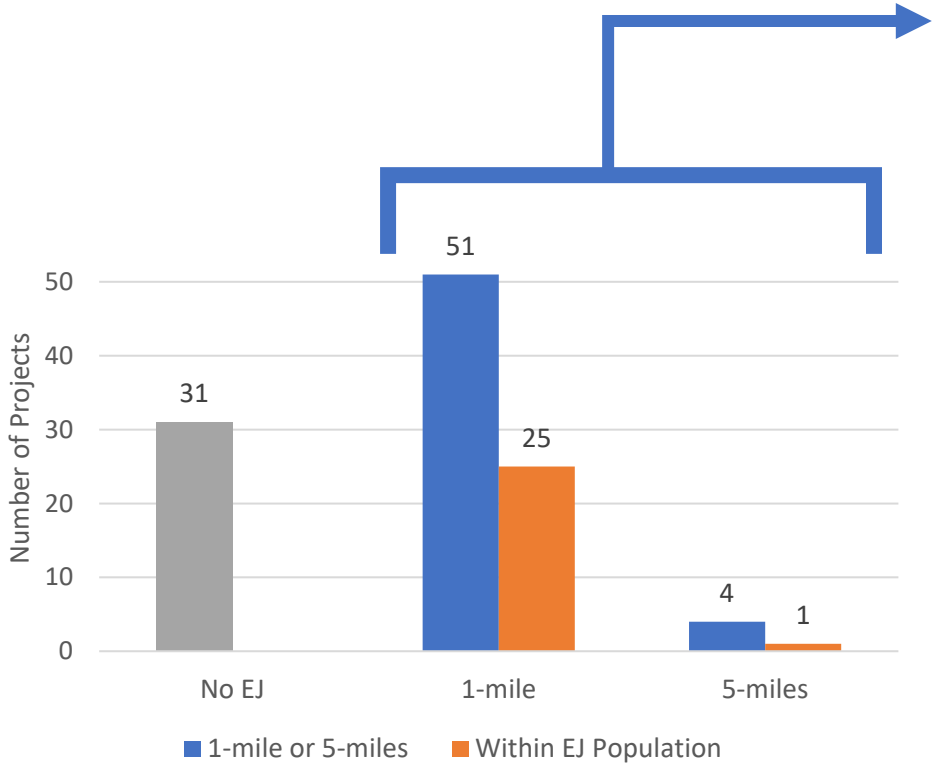




Two projects missing FEMA Zones

MEPA Project Data

EJ Communities



Characteristics of 55 (out of 86) new projects near EJ populations:

High Exposure Rating:

FEMA Zone	Sea Level Rise	Urban Flooding	Riverine Flooding	Extreme Heat
V Zone	6	3	3	3
A Zone	6	13	12	20
X Zone	1	18	15	28
TOTAL	13	34	30	52

MEPA Climate Resiliency Policy: Options

Key Observations from Project Filings

- Many projects outside coastal areas and 100-year floodplain are ranked “High” risk for extreme precipitation/flooding.

- Asset risk ratings (and associated “return period” recommendations) are inconsistent due to user inputs regarding useful life and criticality.

- Very few MEPA filings contain quantitative analyses (e.g., H&H modeling) to demonstrate resiliency to future climate conditions.

MEPA Climate Resiliency Policy: Options

Other Related Resiliency Initiatives

- MA Climate Resilience Design Guidelines Tool
  - As of April 25, 2022: availability of numeric design parameters (projected flood elevation for sea level rise, rainfall volumes for precipitation)

- M.G.L. Chapter 91
  - Potential requirement to consider future sea level rise for construction in areas within c. 91 jurisdiction

- Wetlands / Water Quality Certifications
  - Potential requirements for new buildings in V-zone and A-zone (Moderate and Minimal Wave Action Zones, or MoWA/MiWA)
  - Potential new requirements for stormwater design

MEPA Climate Resiliency Policy: Options

Key Components Under Consideration

1. Continue to require standard output report from MA Resilience Design Tool and discussion of climate resiliency in ENF/EENF.

2. For EIR-level projects, require further analysis to address recommendations from MA Resilience Design Tool for applicable project components, including:
   - Elevation of buildings and structures
   - Stormwater sizing
   - Off-site flood impacts
   - Other applicable quantitative metrics

   ***This requirement would potentially apply to projects requiring EIRs under 301 CMR 11.06(7) (near environmental justice (EJ) populations).*

MEPA Climate Resiliency Policy: Options

3. Create standard useful life and criticality measures by project type so that return period recommendations are consistent.
   - *E.g., long-lived buildings should prepare for medium to high return period recommendation for 2070.*

4. EIR should address legal mandates (building code, wetlands, local regulation), but also consider recommendations from MA Resilience Design Tool. Address flexible adaptation strategies if cannot fully meet recommendations.

5. Proponents would be given discretion to determine specific methodology/modeling to support analysis.

MEPA Climate Resiliency Policy: Options

Key Questions

1. Is it reasonable to require quantitative analysis (e.g., H&H modeling) of project components during MEPA review? Will project design be advanced enough to provide the analysis?

2. Should analysis requirement be limited to certain project types (new construction, “critical” infrastructure), or project location (100- and 500- year flood plain / V and A zones)?

3. Should analysis be required for all EIRs near EJ populations?

4. Should MEPA prescribe specific methodologies for conducting analysis?